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09/327.621 06/08/99 HORIKAWA

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EXAMINER

KIM.P

ART UNIT

PAPER NUMBER

2851

DATE MAILED:

08/09/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.  
09/327,621

Applicant(s)

Horikawa

Examiner

PETER KIM

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jun 26, 2001
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 26-94 and 97-104 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-94 and 97-104 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 08/935,445.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 20) ☐ Other:

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## **DETAILED ACTION**

### ***Request for Continued Examination***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 26, 2001 has been entered.
2. Applicant's arguments filed on 12/12/00 (paper #12) have been fully considered.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 54-104 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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Regarding Claims 54, 59, 66, 71, 76, 83 and 88, the actuator being driven to prevent a positional error, the actuator with a first portion connected to the first stage and the second portion connected to the second stage are not adequately disclosed.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 26-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 26, "cooling unit circulating said cooling fluid from a portion near an optical path of the light beam from said interferometer toward a distant portion" is unclear since the fluid is not flowed to a distant portion, but flows in a circle back to the portion near interferometer.

The remaining claims, not specifically mentioned, are rejected for incorporating the defects from the base claim by dependency.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 38-45, 54-94 and 97-104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of Negishi.

Nishi discloses in Figures 1 and 2 and column 8, line 14 through column 10, line 4, a projection exposure apparatus with a base (ref.19) which holds the scanning stage (ref. 20) and the fine adjustment stage (ref. 21) which holds the mask (ref. 7) and movable mirror (ref. 33, 34A, 34B) for laser interferometers (ref. 35, 36A, 36B) which detect a displacement of the fine adjustment stage. Nishi also discloses the illumination system (ref. 22), projection optical system (ref. 13), substrate (ref. 14) and substrate stage with movable mirror and laser interferometer. Although Nishi does not disclose the substrate located on the fine adjustment stage and the scanning stage, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate stage with such an arrangement. Nishi discloses a means for moving the stage but Nishi does not disclose electromagnetic actuators. Negishi discloses in Figures 1-4 and column 3, line 20 through column 7, line 35, electromagnetic actuators for moving the scanning stages of an exposure apparatus in x- and y-directions. Negishi discloses the stationary member having a coil of the electromagnetic actuator located on the stationary base relative to the moving stage and the movable magnetic portion located on the moving stage. Negishi also discloses cooling unit that cools the stationary member of the electromagnetic actuator. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the base for holding the scanning and fine adjustment stages

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and the electromagnetic actuators and the cooling unit in view of Negishi to the invention of Nishi in order to more efficiently produce semiconductor elements or liquid crystal display element which is well known product of scanning exposure apparatus.

9. Claims 46-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi (5,477,304) in view of Novak et al. (Novak) (5,623,853).

Nishi discloses in Figures 1 and 2 and column 8, line 14 through column 10, line 4, a projection exposure apparatus with a base (ref. 19) which holds the scanning stage (ref. 20) and the fine adjustment stage (ref. 21) which holds the mask (ref. 7) and movable mirror (ref. 33, 34A, 34B) for laser interferometers (ref. 35, 36A, 36B) which detect a displacement of the fine adjustment stage. Nishi also discloses the illumination system (ref. 22), projection optical system (ref. 13), substrate (ref. 14) and substrate stage with movable mirror and laser interferometer. Although Nishi does not disclose the substrate located on the fine adjustment stage and the scanning stage, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate stage with such an arrangement. Nishi discloses a means for moving the stage but Nishi does not disclose electromagnetic actuators and cooling means of liquid. However, Novak discloses Novak discloses cooling unit that cools the stationary member of the electromagnetic actuator which are arranged in the scanning direction and the direction perpendicular to the scanning direction. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the cooling system of Novak to the invention of Nishi in order to protect the stage moving means from excessive heat.

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10. Claims 54-94 and 94-104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makinouchi et al. (Makinouchi) (5,699,145) in view of Negishi.

Makinouchi discloses in Figures 1-4, a projection exposure apparatus with a base which holds the scanning stage and the fine adjustment stage which holds the mask and movable mirror for laser interferometers which detect a displacement of the fine adjustment stage. Makinouchi also discloses the illumination system, projection optical system, substrate and substrate stage with movable mirror and laser interferometer. Although Makinouchi does not disclose the substrate located on the fine adjustment stage and the scanning stage, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate stage with such an arrangement. Makinouchi discloses a means for moving the stage but Makinouchi does not disclose electromagnetic actuators. Negishi discloses in Figures 1-4 and column 3, line 20 through column 7, line 35, electromagnetic actuators for moving the scanning stages of an exposure apparatus in x- and y-directions. Negishi discloses the stationary member having a coil of the electromagnetic actuator located on the stationary base relative to the moving stage and the movable magnetic portion located on the moving stage. Negishi also discloses cooling unit that cools the stationary member of the electromagnetic actuator. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the base for holding the scanning and fine adjustment stages and the electromagnetic actuators and the cooling unit in view of Negishi to the invention of Makinouchi in order to more efficiently

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produce semiconductor elements or liquid crystal display element which is well known product of scanning exposure apparatus.

***Allowable Subject Matter***

11. Claims 30-37 are allowed.
12. Claims 26-29 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, set forth in this Office action.

***Remarks***

13. Applicant amended the claims to recite that the actuator prevents a positional error between the scanning stage and the fine adjustment stage. However, both Nishi and Makinouchi reference teach preventing positional error by aligning the stages correctly.

***Conclusion***

14. All claims are rejected.
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to

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the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



PBK

08/07/01



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